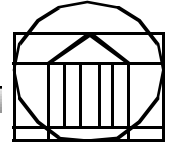




"Pride in Performance"

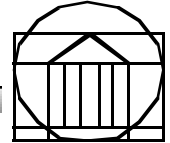


Performance Modeling for the HLA

Sudhir Srinivasan
Mystech Associates, Inc.

Paul F. Reynolds, Jr.
University of Virginia

Project Overview



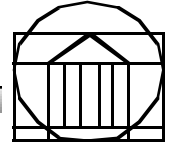
■ What?

- Configurable simulation model of HLA-compliant federations
- **Performance** model: stochastic, resource usage and contention

■ Why?

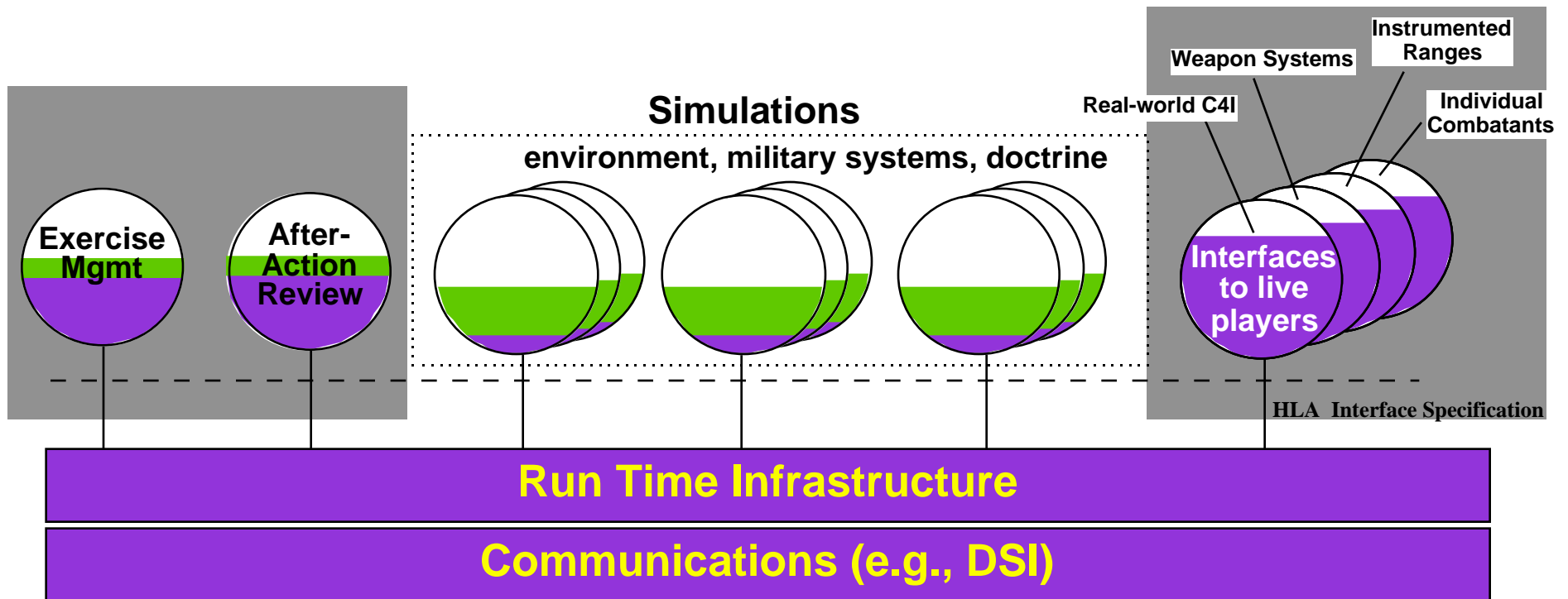
- Performance characteristics of current and future federations - federation analysis tool
- Broader testing and more economical than prototyping
- Non-intrusive analysis




Modeling Approach



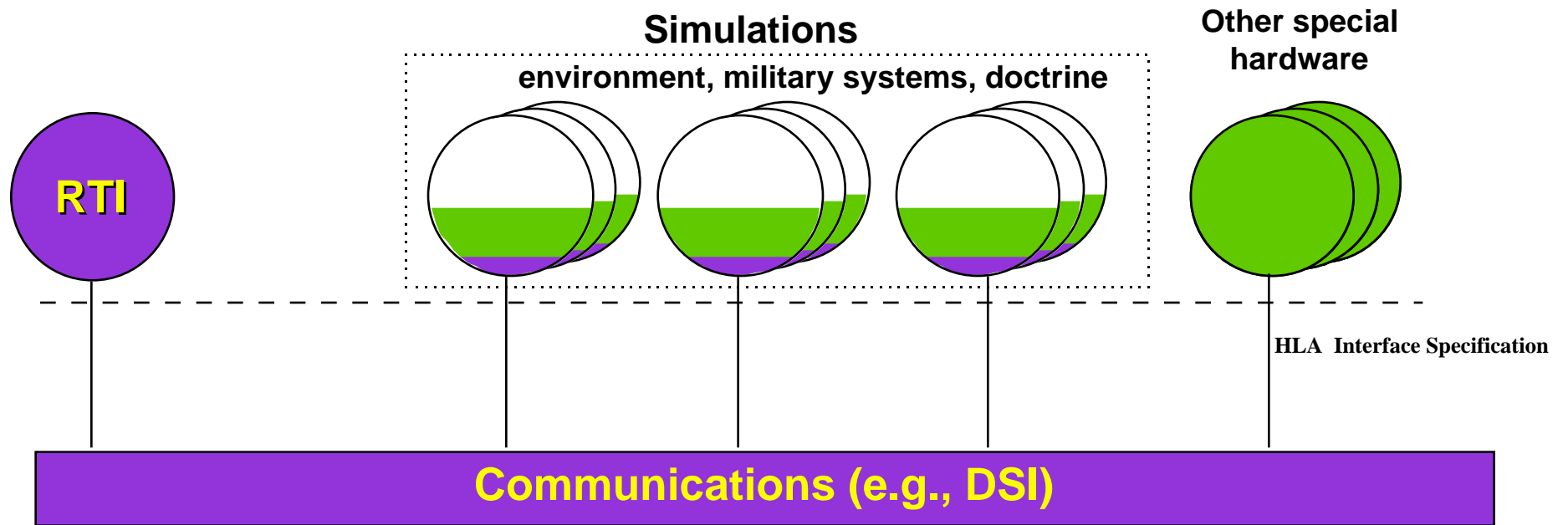
- Data gathering
 - Conceptual model construction
 - Implementation using SES/Workbench
 - Validation
 - Experiments and analyses
-
- A flow diagram is drawn over the list items. It consists of two vertical ovals. The left oval encloses the items 'Conceptual model construction' and 'Validation'. The right oval encloses the items 'Implementation using SES/Workbench' and 'Experiments and analyses'. A curved arrow points from the bottom of the left oval to the top of the right oval. Another curved arrow points from the top of the right oval to the top of the left oval, creating a clockwise cycle between the two groups of activities.

Performance Perspective



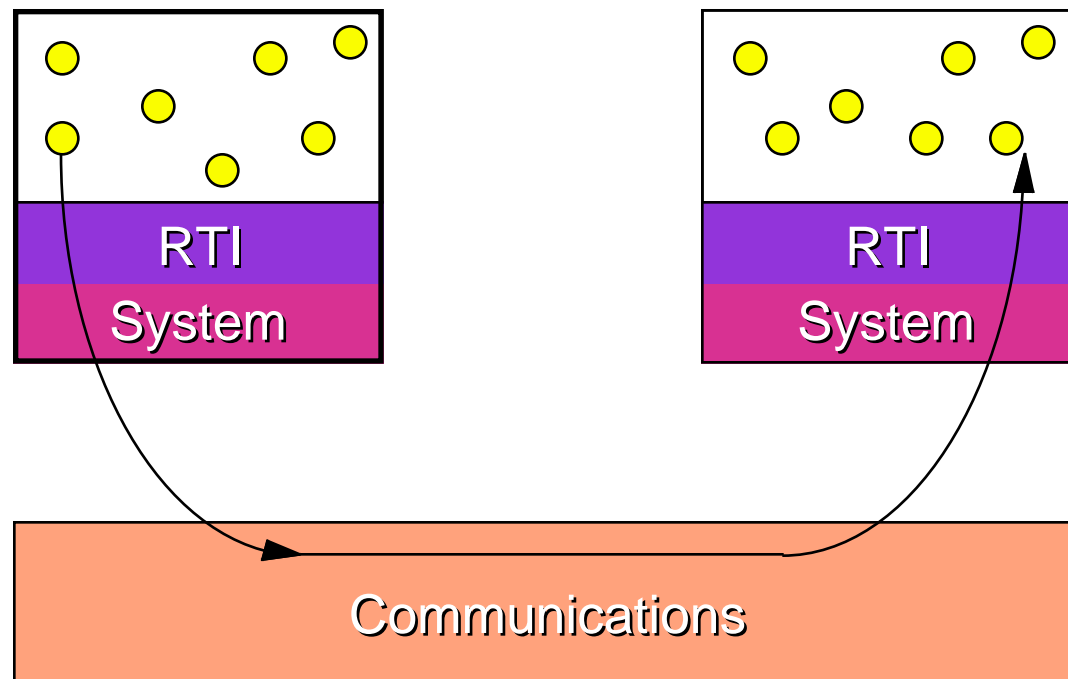
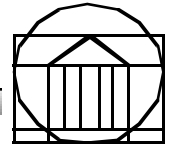
- Key:
-  developed once, reusable across all DoD simulation systems
 -  developed once, reusable across a simulation domain
 -  unique

Physical Organization

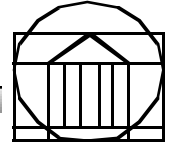


- Key:
- developed once, reusable across all DoD simulation systems
 - developed once, reusable across a simulation domain
 - unique

Federate Submodel



Objects

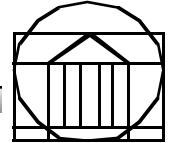


■ Carry their own parameters

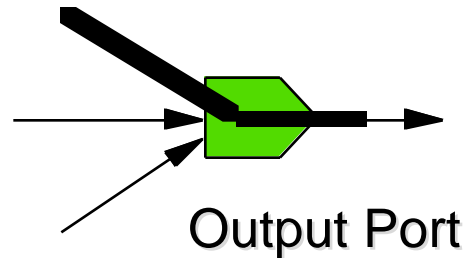
- Id
- Class
- Group
- Execution time
- Activity state
- Transition matrix
- Probability of selection
- Probability distribution for generating RTI calls
- <others>

	H	M	Q	P
H	0.5	0.4	0.1	0.7
M	0.1	0.2	0.7	0.2
Q	0.1	0	0.9	0.1

Communications Submodel

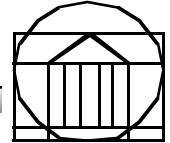


- Currently focused on JPSPD comms: ATM Switch



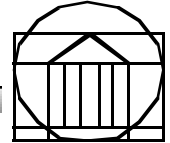
- Transport delay = latency + message size/bandwidth

Performance Framework



- List of MoP's
 - Latency
 - Resource Utilization
 - Configuration Variables
 - Control Variables
-
- Being used by JPSPD to design experiments

Project Status



- Basic conceptual model complete
- Model infrastructure implemented and running
 - objects
 - machines
 - communications
- Enhancements being added
 - publish/subscribe
 - event driven federates
 - interactions
 - event sequences for RTI calls
 - more communications